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# PATENT ABSTRACTS OF JAPAN

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(21)Application number : 02-114196 (71)Applicant : TOYODA GOSEI CO LTD  
RES DEV CORP OF JAPAN

(22)Date of filing : 27.04.1990 (72)Inventor : MANABE KATSUHIDE  
MABUCHI AKIRA  
KOTAKI MASAHIRO  
KATO HISAYOSHI

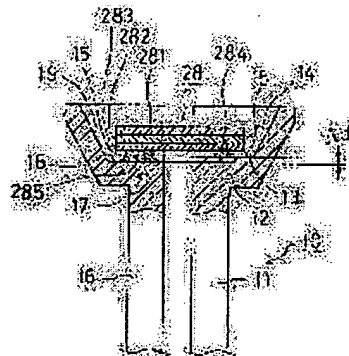
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## (54) LIGHT-EMITTING DIODE

### (57)Abstract:

**PURPOSE:** To eliminate the inclination of an optical axis of light radiated from a light-emitting chip by a method wherein two lead member where flat parts on which the light-emitting chip is mounted and bonded by a solder bump are provided and the height of the flat parts of the two lead members is made different.

**CONSTITUTION:** Since an electrode part 284 of an n-GaN layer 282 for a light-emitting chip 28 is formed by utilizing the inside of a hole made in one part of an n-GaN layer 283; it is not possible to make its size as large as an electrode part 285 of the i-GaN layer 283. When solder bumps 15 are formed at the electrode parts 284, 285, the difference  $\Delta d$  in a height between the solder bumps is caused in proportion to the area ratio of the electrode area of the i-GaN layer to the electrode area of the n-GaN layer. When the difference in a level of the nearly same size is formed at flat parts 13, 18 of lead members 11, 16 so as to correspond to the difference  $\Delta d$  in the height between the bumps, light radiated from the surface of the bonded light-emitting chip 28 is in the designed optical-axis direction decided by the flat parts 13, 18 of the lead members 11, 16 and is stabilized.



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## LEGAL STATUS

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